

Using Subsurface Transport Research to Achieve Agency Outcomes

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Gasoline leaks from underground storage tanks can cause ground water contamination because there are a number of organic chemicals in gasoline. These chemicals have varying properties that influence how far contamination extends from the release. Research on transport of these chemicals has provided direct input to Agency decision-making or support for program implementation. Four examples of the influence of this work will be given.

In 1998, EPA convened a blue-ribbon panel to investigate all aspects of Methyl tert-butyl ether (MTBE) usage as a gasoline additive. Research done in collaboration with the New York State Department of Environmental Conservation (NYSDEC) provided the panel with detailed data on MTBE transport from sites on Long Island, which is one area of the country with significant impacts to ground water from leaking tank sites.

In a later assessment of MTBE usage, the Agency pondered the question of reducing MTBE content in gasoline from 11% to 3%. A transport analysis that used ORD developed models concluded that concentrations in ground water would indeed be reduced in proportion to the reduction in MTBE content in gasoline, but that the extent of contamination would be reduced by a much smaller amount.

A company had an idea for a suite of unique tracers to be used in tank testing, but the environmental impacts of these chemicals were unknown. ORD provided an analysis of how the tracers would behave during leaks by performing a comparative analysis MTBE and benzene transport. This allowed the Agency to make a decision on the use of the tracers with information on how these tracers would impact ground water and other environmental media (air).

The most publicized application of this research to fuel problems is the OnSite on-line calculator web site at www.epa.gov/athens/onsite. The calculators were developed for State Agency regulators and private sector consultants and include practical, and sometimes simple, calculations, models and unit conversions. The site also conveys research results that can improve practice in this field. Examples where this is known to have occurred are with recharge-driven diving of plumes, effective solubility of chemicals in mixtures and input parameter-induced model uncertainty.

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